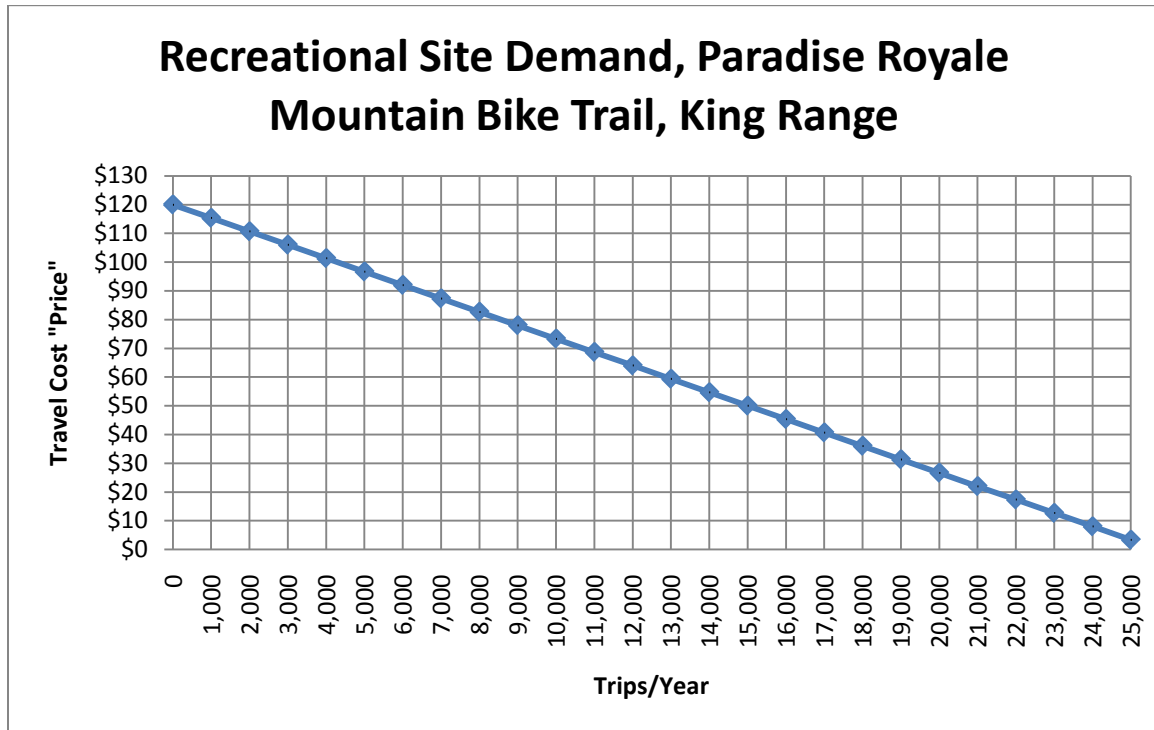


Quiz 2, Economics 423, Fall 2009 (Prof. Hackett)

Name: **KEY** Answer any 10 of the 13 numbered questions below. Put a BIG X through the 3 questions you don't want me to grade. All questions are equally weighted and worth the same number of points.

Part I: All Students:

1. True or **false** (circle one): If a job is similar to many others but (i) involves an annual risk of premature death on the job that is 0.00008 (8 per 100,000) higher, and (ii) pays a wage premium of \$400 per year, then based on this data, the value of a statistical life is \$6 million.
2. **True** or false (circle one): When an individual quota system is imposed on a fishery that had been managed with a total allowable catch and a season opening, the result can be a slowing of the race for fish, or derby, and a more even distribution of landings over the whole season.
3. True or **false** (circle one): Elinor Ostrom's design principles for governance of common-pool resources (from chapter 16) provide a step-by-step guide for groups of resource users to sell their shares to a single private owner, who can then exclude others from accessing the resource.
4. **True** or false (circle one): In the economic analysis done by the California Energy Commission regarding removal of the Klamath River dams, the cost of keeping the dams and providing fish passage and other environmental mitigations was generally higher than the cost of removing the dams and providing replacement power for those who had been buying hydroelectric power from these dams.
5. True or **false** (circle one): The supply of a particular piece of legislation derives from the preferences and values of the interest groups that benefit from, and are thus willing to pay for, the legislation.
6. **True** or false (circle one): Results from the median voter theorem explain why politicians tend to gravitate toward the political center in a general election, where most of the voters are located, and away from the extreme positions of their respective political parties.
7. **True** or false (circle one): Economically valuable ecosystem services, such as air and water purification, decomposition of wastes, and renewal of soil fertility, represent the beneficial flow from the stock of natural capital.



8. Calculate annual recreational consumer surplus for the Paradise Royale Mountain Bike Trail, evaluated at a travel cost price of \$50 per trip.

Annual consumer surplus (\$CS) = **\$525,000** (show your work) = $(120-50) \times 15,000 / 2$

9. Over a 10 year time horizon, and based on a 5 percent real discount rate, the present value of consumer surplus (the PV of total recreational benefit) equals = $[\$CS/0.05] \times [0.386087]$
= **\$4,053,914**

10a. One-time trail repair cost in year 0 is \$400,000. Annual maintenance and management cost is \$100,000 per year over a 10 year time horizon. Based on a 5 percent real discount rate, the present value of total cost equals $\$400,000 + [\$100,000/0.05] \times [0.386087]$
= **\$1,172,174**

10b. The PV of total net benefits = **\$2,881,740.**

Part III. ONLY For students who are NOT in the 4th unit lab:

Effort	TEC	MEC or AEC	MRP	ARP	TRP	Group Profit
1	\$400	\$400	\$4,000	\$4,000	\$4,000	\$3,600
2	\$800	\$400	\$3,600	\$3,800	\$7,600	\$6,800
3	\$1,200	\$400	\$3,200	\$3,600	\$10,800	\$9,600
4	\$1,600	\$400	\$2,800	\$3,400	\$13,600	\$12,000
5	\$2,000	\$400	\$2,400	\$3,200	\$16,000	\$14,000
6	\$2,400	\$400	\$2,000	\$3,000	\$18,000	\$15,600
7	\$2,800	\$400	\$1,600	\$2,800	\$19,600	\$16,800
8	\$3,200	\$400	\$1,200	\$2,600	\$20,800	\$17,600
9	\$3,600	\$400	\$800	\$2,400	\$21,600	\$18,000
10	\$4,000	\$400	\$400	\$2,200	\$22,000	\$18,000
11	\$4,400	\$400	\$0	\$2,000	\$22,000	\$17,600
12	\$4,800	\$400	-\$400	\$1,800	\$21,600	\$16,800
13	\$5,200	\$400	-\$800	\$1,600	\$20,800	\$15,600
14	\$5,600	\$400	-\$1,200	\$1,400	\$19,600	\$14,000
15	\$6,000	\$400	-\$1,600	\$1,200	\$18,000	\$12,000
16	\$6,400	\$400	-\$2,000	\$1,000	\$16,000	\$9,600
17	\$6,800	\$400	-\$2,400	\$800	\$13,600	\$6,800
18	\$7,200	\$400	-\$2,800	\$600	\$10,800	\$3,600
19	\$7,600	\$400	-\$3,200	\$400	\$7,600	\$0
20	\$8,000	\$400	-\$3,600	\$200	\$4,000	-\$4,000

There are five fishers working a fishery. A fisher's share of group profit is equal to her share of total effort. Example: Fisher A's profit = [(A's effort)/(total group effort)] x group profit.

11. Suppose the five fishers agree to each provide 2 units of effort (e.g., 2 fishing trips each) in order to achieve the maximum level of group profit for the fishery. How much profit would an individual fisher receive if each of the five provides 2 units of effort as they agreed (total effort = 10)? Show your work.

Individual fisher's profit at group optimum = \$3,600 = \$18,000/5

12. Suppose one of the fishers decides to cheat on this agreement and provide 6 units of effort, while the other four fishers continue to provide 2 units of effort each. How much profit would the cheater receive if she provides 6 units of effort, while the other four fishers continue to provide 2 units of effort each (total effort = 14)? Show your work.

Cheater's profit = \$6,000 = (6/14)*\$14,000

13. How much profit would each of the four individual non-cheaters receive if each continues to provide 2 units of effort, while the cheater provides 6 units of effort (total effort = 14)? Show your work.

Individual non-cheater's profit = \$2,000 = (2/14)*\$14,000

Briefly explain in words how this example relates to the incentive to over-fish and perhaps lead to tragedy of the commons. **Incentive to cheat can unravel agreement to limit effort. Need effective property rights regime and enforcement....**

Part IV: ONLY for students in 4th unit lab:

Suppose that there are 1000 units of a nonrenewable resource available over two periods (0 and 1). Demand in each period is given by $P = 2400 - Q$. Marginal cost is a constant 400 in both periods. The discount rate is 0 percent.

11. What is the dynamically efficient allocation of the 1000 units of the nonrenewable resource, and what will be the prices in the two periods? Please show your work.

$$Q_0 = \underline{500}$$

$$P_0 = \$\underline{1,900}$$

Apply Hotelling's rule....

$$Q_1 = \underline{500}$$

$$P_1 = \$\underline{1,900}$$

12. Suppose that the basic setup of the problem above were the same, except that now the discount rate rises to 20 percent. Re-compute the dynamically efficient allocation of the 1000 units of the nonrenewable resource. Please show your work.

$$Q_0 = \underline{636.36}$$

$$P_0 = \$\underline{1,763.64}$$

Apply Hotelling's rule....

$$Q_1 = \underline{323.64}$$

$$P_1 = \$\underline{2,036.36}$$

13. Correctly draw the price paths for questions 8 and 9 above in a single fully-labeled diagram. Provide a brief economic explanation for why the two price paths have different slopes.

Price on “y” axis, time on “x” axis, show time period 0 and 1 prices for answers 11 and 12. Discuss how price path gets steeper as discount rate gets larger, and that this occurs b/c higher discount rates make current consumption more important than future consumption, thus tilting the resource allocation toward period 0 at the expense of period 1.